Precision Mortar Systems Overview

Precision Strike Summer PEO Forum

27-28 July 2005

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Product Manager
Mortar Systems

Task and Purpose

Task

Provide An Overview on Current and Future Mortar Systems

Purpose

Show How These Systems Provide Precision Strike Capabilities to the Current and Future Forces.

Overall Agenda

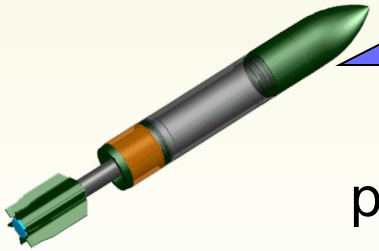
- **Mission and Vision**
- **Precision Guided Mortar Munition**
- **Mortar Fire Control System**
- **Summary**

PM Mortars

Mission

Life Cycle Manager for the full range of **mortar systems** to include **weapons**, **fire control**, and **advanced ammunition** integrated across **Current and Objective Forces**

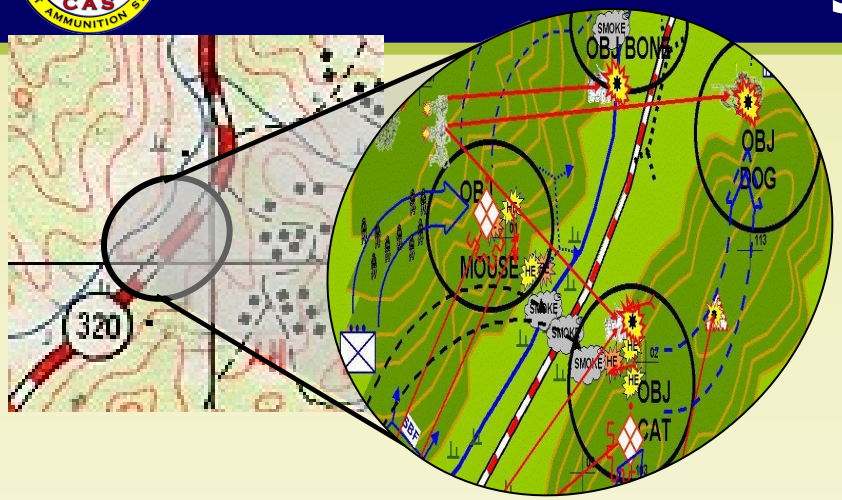
Vision



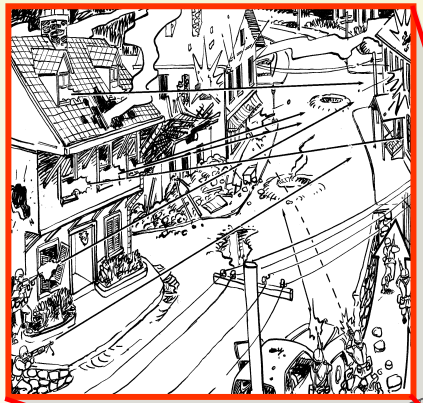
To Be the **Mortar Systems Expert** who provides the **Close Combat Warfighter** with the **World's Best <u>Integrated</u> Mortar Systems**

XM395
Precision Guided Mortar Munition (PGMM)

Close Fight - Present



0.5 – 1.0 km



TASKS: **Destroy / Defeat threats; Influence Situation**

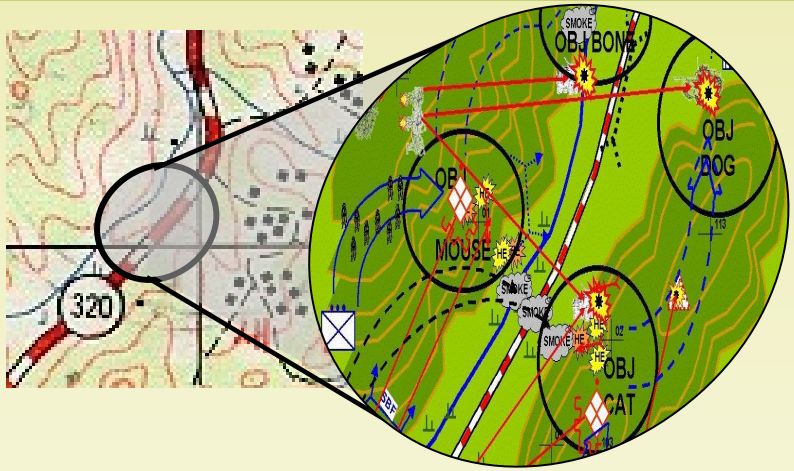
***AREA OF OPERATIONS*: Complex terrain & vegetation that limit mounted movement, 5 – 7 KM of battlespace; Urban clutter, rubbled terrain, 0.5 – 1.0 KM of battlespace**

TARGETS: **Primarily Infantry-based, supported by mechanized/armored platforms, mortars & artillery. Hasty to deliberate fortified fighting positions. Deliberate fight when in direct fire contact**

***EXISTING CAPABILITIES*:**

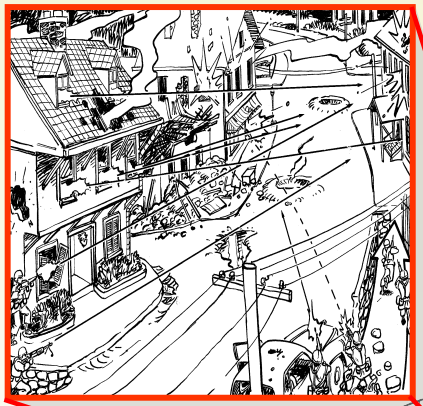
- **Limited range, primarily analog C^2 (FM voice)**
- **Limited indirect precision munitions**
- **Heavy, constrictive ballistic protection**
- **Limited, non-integrated, combat ID**
- **Manned LRS**
- **Wire-guided “heavy” AT systems**
- **Limited “fire-&-forget” AT systems**
- **Burdensome Soldier’s load**
- **Limited mobility/survivability capabilities (especially in MOUT)**

Close/Decisive Fight – Future Requirements



10 – 12 km

1.0 – 1.5 km



TASKS: **Destroy / Defeat threats; Influence Situation**

AREA OF OPERATIONS: **Complex terrain & vegetation that limit mounted movement, 10 – 12 KM of battlespace; Urban clutter, rubbled terrain, 1 – 1.5 KM of battlespace**

TARGETS: **Primarily Infantry-based, supported by fleeting mechanized/armored platforms, mortars & artillery. Limited deliberate fortified fighting positions. Deliberate fight when in direct fire contact**

REQUIRED CAPABILITIES:

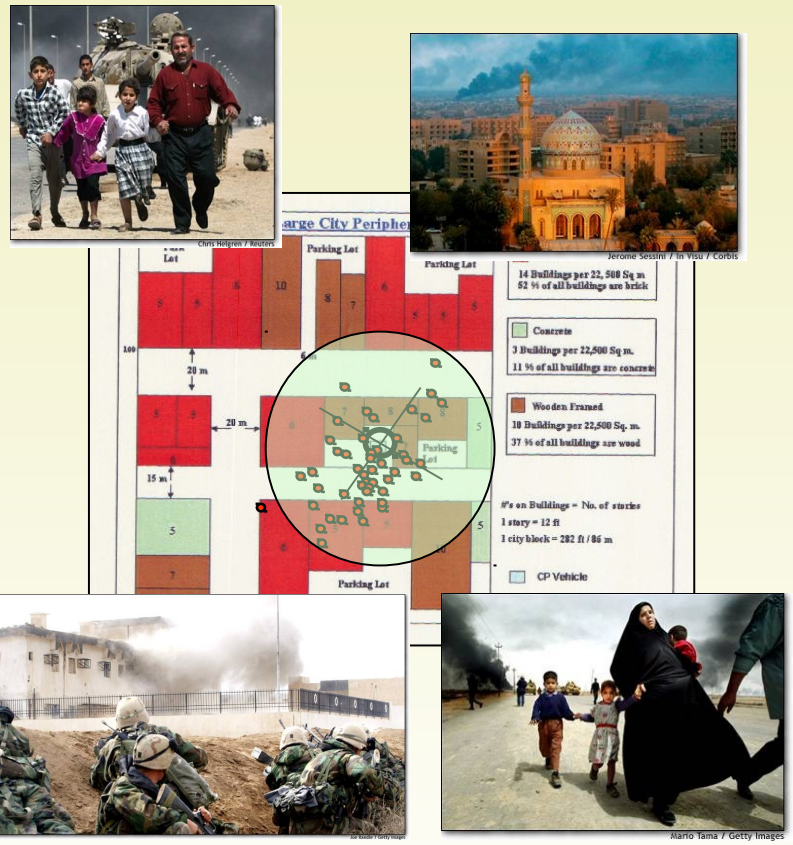
- **Extended range, urban capable, digital data & voice C^2 systems**
- **Precision direct/indirect engagement capability**
- **Light, tailorable, complete ballistic protection**
- **Integrated, soldier/platform combat ID**
- **Manned and unmanned recon capabilities**
- **All AT systems "fire-&-forget"**
- **Tailorable, light-weight Soldier's load**
- **Enhanced mobility/survivability capabilities (especially in MOUT)**
- **Integrated non-lethal capabilities**

Indirect fire options begin to fall off when the Close Fight closes on the Objective…

Minimize "unintentional or incidental injury or damage to persons or objects that would not be lawful military targets in the circumstances ruling at the time."

- JP 1-02 "DoD Dictionary of Military and Associated Terms"

"Danger Close" Distance (meters)	Munition
750 m	Naval Gun Fire (5 inch or smaller)
600 m	155mm Conventional Artillery
225 m	GBU-31 Joint Direct Attack Munition (JDAM)
175 m	2.75 inch Rockets
170 m	M934 120mm Mortar (HE)
100 m	M720 60mm Mortar (HE)



Precision Required to Effectively Engage the Enemy in the Close Fight

PGMM Enables the Maneuver Commander

What does it do?:

- Adds a special purpose “hit a target” precise round of ammunition to the family of munitions for the battalion 120mm mortar system
- Enables the maneuver commander to incapacitate/kill individuals (snipers), small groups of threat soldiers (crew-served weapons teams), or mounted squads who have taken cover within close proximity to civilians and valued infrastructure
- Reducing the number of rounds fired and time required to fire those round allows the maneuver commander to maintain his operational tempo
- Reduces the risks of collateral damage to civilians and valued infrastructure in close proximity to these individuals, teams, and squads

What does it not do?:

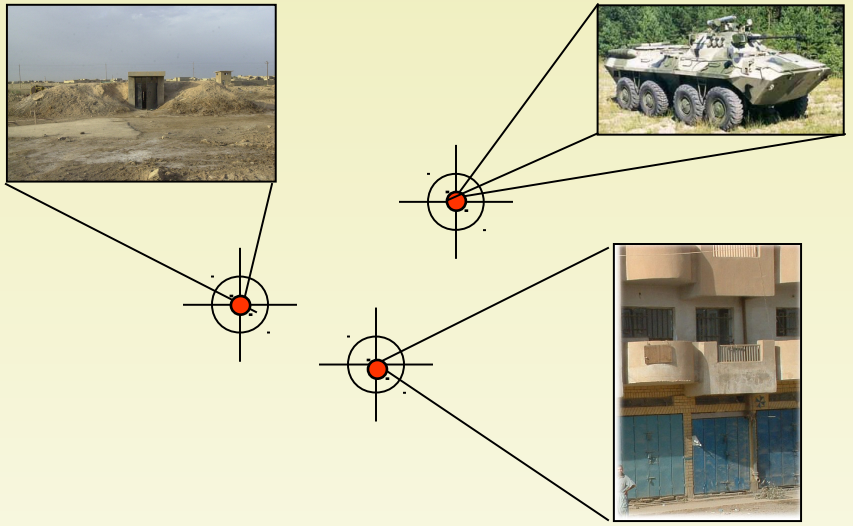
- Alter the traditional role of the mortar
- Replace High Explosive (HE) mortar or HE artillery fires
- Provide a more precise “area” munition

XM395
Precision Guided Mortar Munition (PGMM)

Requirements

Precision Guided Mortar Munition

Suppression → Destruction



High Explosive

- Area Effects
- High Volume Fire
- Defeat Targets in the Open
- Suppress Personnel Under Cover

Precision Guided

- Precision Effects
- 1-2 Rounds to Effect Target
- Incapacitate Personnel Under Cov
- Low Collateral Damage
- Reduced Logistics Footprint

PGMM gives Battalion Commanders Organic Precision Strike, Destructive Capability

Incremental Requirements

PGMM

	Today	2010	TBD**	TBD**
	M934A1 High Explosive	**XM395** PGMM	**XM395A1** PGMM	**XM395A2** PGMM
		Increment 1	**Increment 2**	**Increment 3**
Lethality	**Area Fire***	**< 2 rounds Destruction**	**< 2 rounds Destruction**	**< 2 rounds Destruction**
		Troops Protected by Earth & Timber Bunkers, Masonry Structures, Lightly Armored Vehicles		
Range	**7.2 km**	**7.2 km** →	**10 km** →	**12 km**
ompatibility				

* Suppression of Enemy Troops

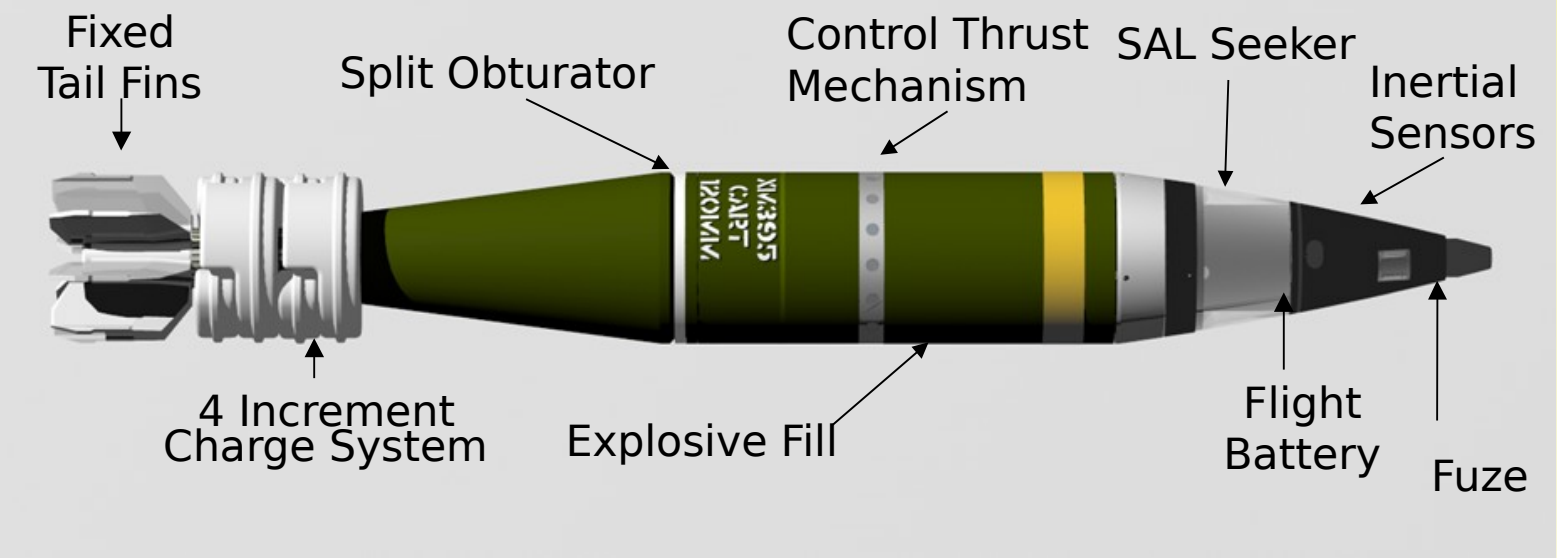
** Dependent on availability of funding and subject to further requirements analysis and approval

Incremental Development will Build on each Version's Successful Fielding and Employment

XM395
Precision Guided Mortar Munition (PGMM)

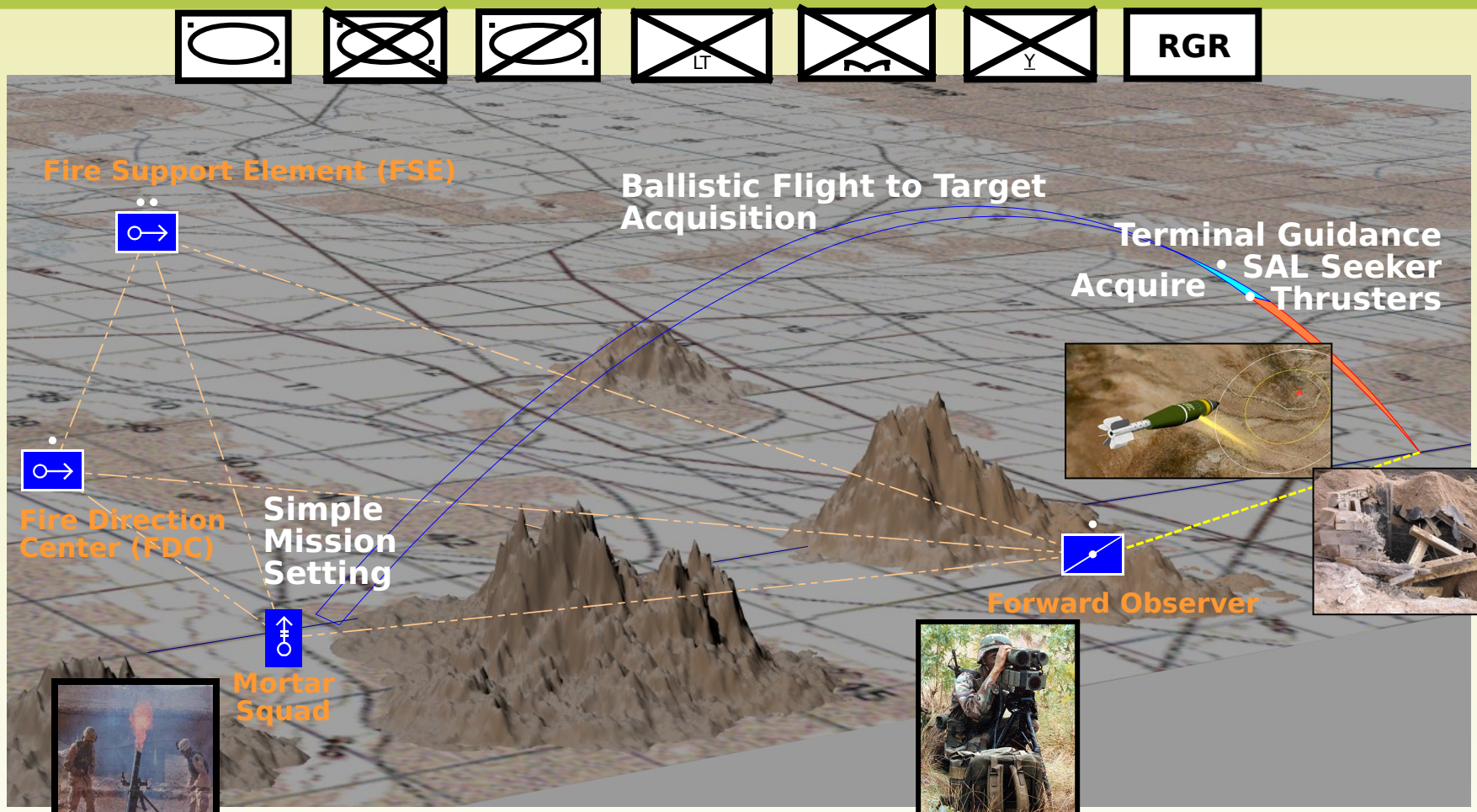
Material Solution

PGMM Material Approach



- Sensor:
  - Strap-down, Semi-Active Laser
- Warhead & Fuze:
  - Unitary Charge, Modified Conventional Fuze
- Airframe:
  - No moving parts, similar to conventional round
- Guidance & Control:
  - Accelerometers, Control Thrusters

PGMM Operational Concept



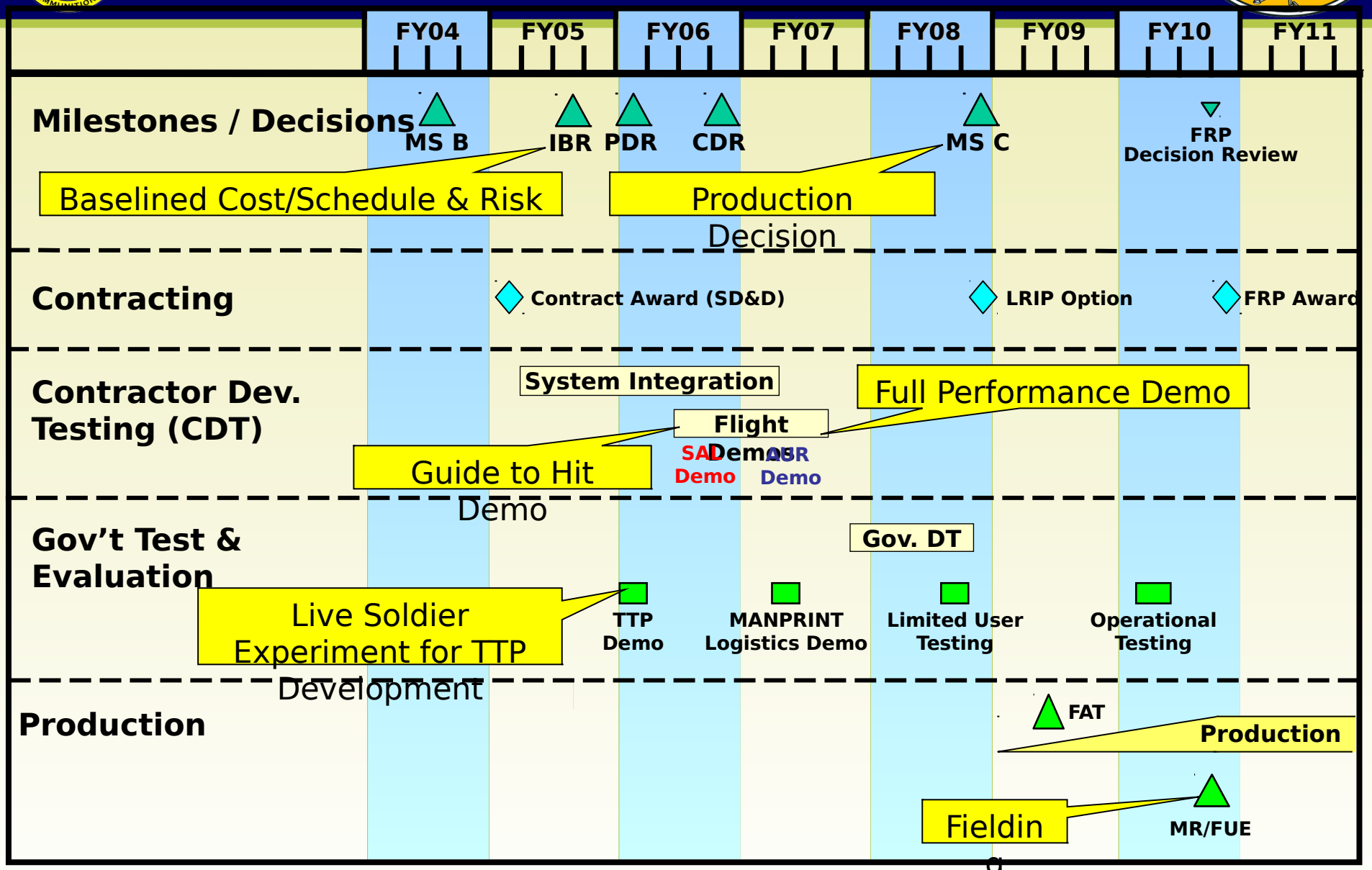
Leverages Existing Fire Support Systems
Reduces Collateral Damage

Masonry Structures
Earth and Timber Bunkers
Light Armor Vehicles

Precision Munitions Increase Warfighter Effectiveness

PGMM (Increment I) Program Schedule

2 June 2005



FRP: Full Rate Production
IBR: Integrated Baseline Review
TTP: Tactics Techniques Proc
AUR: All Up Round
Gov. DT: Government Development Testing
FAT: First Article Test
MR: Material Release
FUE: First Unit Equipped

M95
Mortar Fire Control System (MFCS)

Key Enabling System for PGMM

Mortar Fire Control System
Growth Strategy

MFCS Heavy (H)

PDA

SINCGARS Radio

Gunner's Display

Commanders Interface

Driver's Display

Pointing Devices

V2 Software

Current

LHMBC

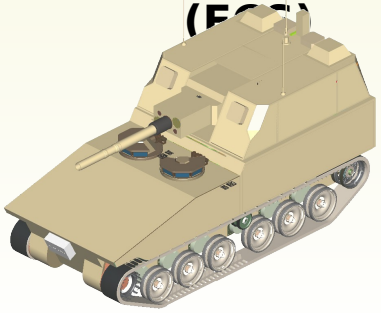
R-PDA (Type-B)

Battery Holder

AA Battery Adapter

V2.1 Software

Objective
Future Combat System (FCS)



MFCS Software

Objective
MFCS-Light
Dismounted

Mortar Fire Control System (Heavy)

System Description

Program Summary

- Version 1 Fielded to the 1st Cav Div (May 03)
- Version 2 Successfully completed Stryker IOT (Feb 04)
- Version 3 JVMF interoperability (Oct 04) SW Block 1
- Version 4 Capabilities for full MR (FY06) SW Block 2
- FY04 Fielding to 3ID & SBCT3
- Production funded through FY07
- Ongoing product improvements

MFCS (H) Heavy

User Payoff

- Command & Control: Interfaces with AFATDS and FBCB2
- Responsiveness: 8 versus 1.5 min for fire for effect
- Accuracy: Reduces CEP from 230 meters to 75 meters
- Survivability: Eliminates soldier dismount, Enables disbursed Operations, "Shoot and Scoot"
- More kills per combat load through improved accuracy (one round to adjust, FFE)

Qualification Program Successfully Completed, Fielding now Underway

Incremental Development Plan

Increment I - Light Weight Hand Held Mortar Ballistic Computer (LHMBC)

- **Ballistic Solutions** for all Mortars, all Missions
- **Digital Communications** with the Fire Support Network (AFATDS - FDC)
- **GPS** - Weapon Position Location Data

Increment II - Mortar Fire Control System – Light (MFCS-L)

- *Ballistic Solutions for all Mortars, all Missions*
- *Complete Digital Linkage with the Fire Support Network (AFATDS - FDC -* **Guns**)
- *GPS Weapon Location*
- **Weapon Pointing (Indirect)**
- **Direct Lay Day / Night Engagement**

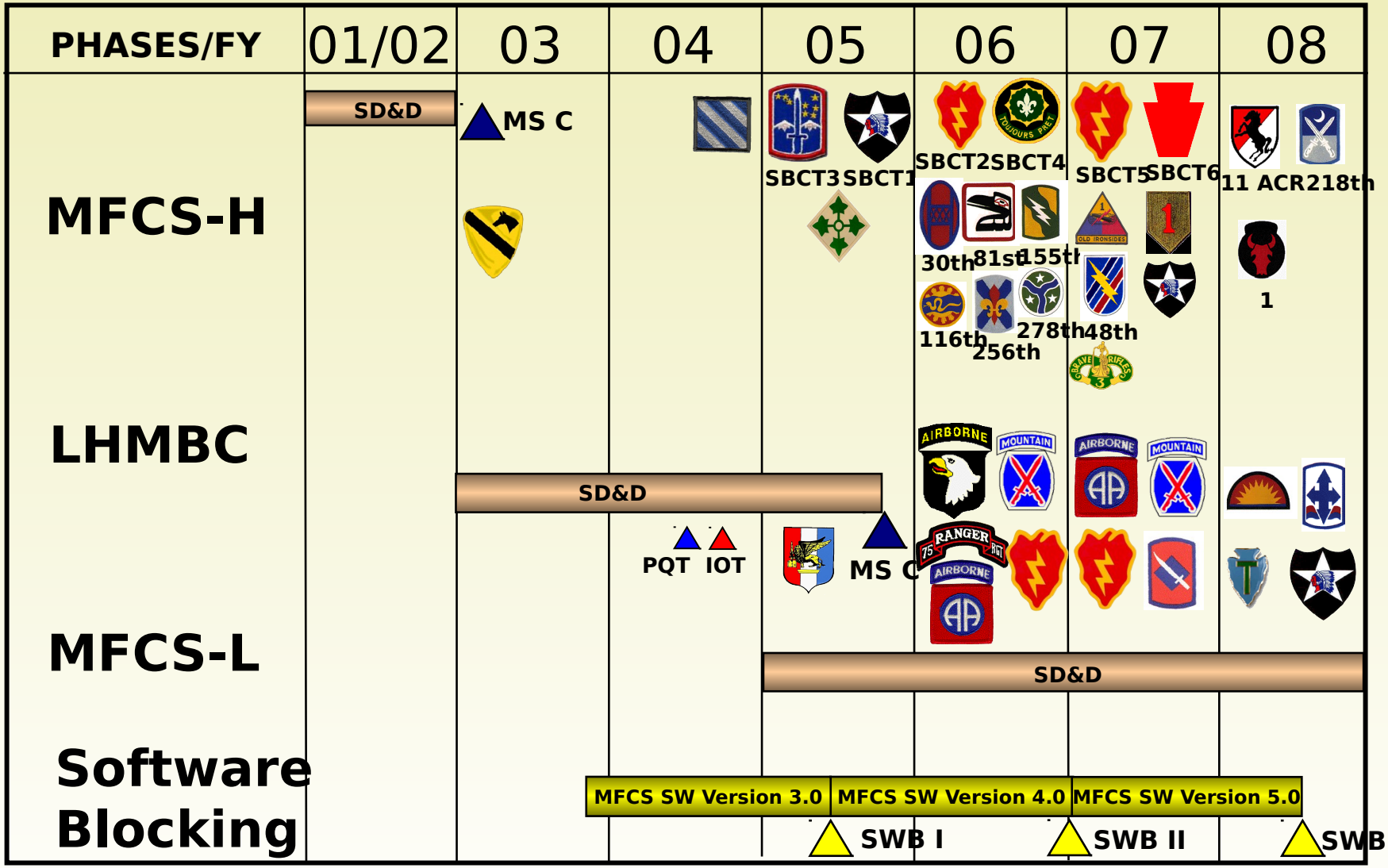
Incremental Development

- *Ballistic Calculations*
- *Weapon Position (GPS)*
- *Digital Communication*
  - *AFATDS - FDC*
  - *AFATDS/FDC – Guns*
- *Weapon Pointing and Aiming*

Inc I LHMBC — ***Inc II MFCS-L***

Requirement Documents
Inc I - MFCS ORD 1994 (LHMBC UFD 2003)
USMC MBC ORD 2002
Inc II - FCS ORD 2004

Mortar Fire Control Fielding Schedule



Schedule Supports Modularity

Summary

- **PGMM – Precision Mortar Capability**
  - **Maneuver Commanders “Hip Pocket” Precision Strike Capability**
  - **Low Collateral Damage**

- **MFCS-(Light and Heavy) being fielded to Light, Heavy and Stryker BCTs – Responsive, Accurate, Survivable**

Precision Mortar Systems

ACCURATE – LETHAL - RESPONSIVE

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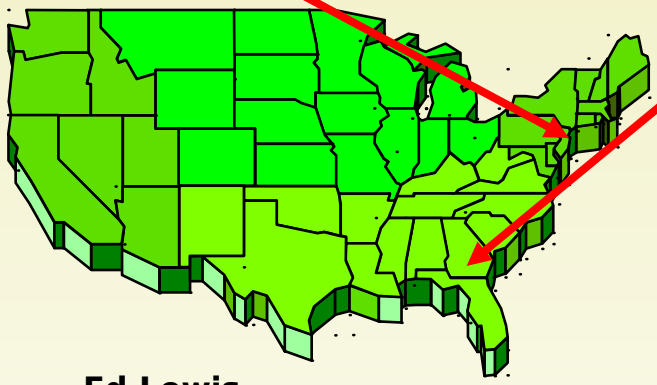

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OPM Mortars will Host the 2005 Mortar Conference on 18-20 October in Morristown, New Jersey, USA.

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